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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/576,663	02/22/2007	Quentin Roberts	H0005838-2930	8172

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EXAMINER
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PRAGER, JESSE M

ART UNIT	PAPER NUMBER
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3745

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10/13/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/576,663	<b>Applicant(s)</b> ROBERTS ET AL.	
	<b>Examiner</b> JESSE PRAGER	<b>Art Unit</b> 3745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 3/29/2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 15-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 15-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 4/21/2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 15-17, and 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Erdmann et al. (WO Publication 2003/080999) in view of Leavesley (US Patent 5,231,831).

In regards to claim 15, Erdmann et al. discloses a turbine housing assembly for an exhaust-gas-driven turbocharger, comprising:

a sector-divided turbine housing (Fig. 2) defining a generally annular chamber structured and arranged to surround a turbine wheel (3), a plurality of circumferentially spaced dividing walls (25, 26) extending generally radially inwardly from a radially outer wall of the chamber and dividing the chamber into a plurality of separate angular sectors each of which occupies a fractional part of a circumference of the chamber, each sector of the chamber at a radially inward side thereof having an axial length;

a vane assembly (10, 23 and 24) for guiding flow from the chamber into the turbine wheel, the vane assembly comprising a ring of circumferentially spaced vanes that include dividing vanes (23, 24) and additional vanes (10) mounted on a fixed structure of the turbine housing assembly, the dividing vanes corresponding in number to the number of dividing walls, each dividing vane forming an extension of one of the dividing walls and extending generally

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radially inwardly from the dividing wall and terminating at a trailing edge of the dividing vane, the additional vanes being located circumferentially between the dividing vanes; and

a variable-geometry mechanism (Fig. 1) comprising a tubular piston (17) disposed radially inward of the chamber and axially slidable relative to the chamber between a fully open position a closed position in which a fractional portion of the axial length of the sectors is blocked by the piston, wherein the piston and the vanes overlap radially and at least the dividing vanes are received in axially extending slots in the piston when the piston is in the closed position;

wherein the dividing vanes (23,24) extend fully across the axial length of the sectors so that the sector-division of the turbine housing is preserved when the piston is in the fully open position.

Erdmann et al. is silent as to whether the additional vanes extend along less than the axial length of the sectors and are axially located such that when the piston is in the closed position a portion of the sectors remain open and the additional vanes extend fully across the portion, and when the piston is in the fully open position there is a space between ends of the additional vanes and an end of the piston.

Leavesley discloses additional vanes (102) extend along less than the axial length of the sectors (104) and are axially located such that when the piston is in the closed position a portion of the sectors remain open and the additional vanes extend fully across the portion (Fig. 14), and when the piston is in the fully open position there is a space between ends of the additional vanes and an end of the piston (Fig. 15).

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It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Erdmann et al. such that the additional vanes are axially shorter than the sectors, the additional vane structure extends across the portion and a portion of the sectors remain open in the closed position, and there is a space between ends of the additional vanes and an end of the piston in the open position, as taught by Leavesley because the overlapping design of the vanes of Leavesley enables a more appropriately responsive turbocharger (Col. 1, lines 25-41).

In regards to claim 16, the modified Erdmann et al. turbocharger comprises the slots in the piston extend radially inwardly less than a fully radial thickness of the piston, such that the slots do not go all the way through to a radially inner side of the piston.

In regards to claim 16, the modified Erdmann et al. turbocharger does not disclose the slots in the piston extend radially inwardly from a radially outer side of the piston.

Leavesley discloses slots in the piston extend radially inwardly from a radially outer side of the piston (Fig. 13).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the Erdmann et al. turbocharger such that the slots in the piston extend radially inwardly from a radially outer side of the piston, as taught by Leavesley because the slot structure enables sector vanes to expand relative to the piston due to thermal stresses.

In regards to claim 17, the modified Erdmann et al. turbocharger comprises the additional vanes and piston are arranged such that in the closed position of the piston, an end of the piston abuts ends of the additional vanes.

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In regards to claim 19, Erdmann et al. discloses a turbine for an exhaust gas-driven turbocharger, comprising:

a turbine wheel (3);

a sector-divided turbine housing (Fig. 2) defining a generally annular chamber structured and arranged to surround the turbine wheel (3), a plurality of circumferentially spaced dividing walls (25, 26) extending generally radially inwardly from a radially outer wall of the chamber and dividing the chamber into a plurality of separate angular sectors each of which occupies a fractional part of a circumference of the chamber, each sector of the chamber at a radially inward side thereof having an axial length;

a vane assembly (10, 23 and 24) for guiding flow from the chamber into the turbine wheel, the vane assembly comprising a ring of circumferentially spaced vanes that include dividing vanes (23, 24) and additional vanes (10) mounted on a fixed structure of the turbine housing assembly, the dividing vanes corresponding in number to the number of dividing walls, each dividing vane forming an extension of one of the dividing walls and extending generally radially inwardly from the dividing wall and terminating at a trailing edge of the dividing vane, the additional vanes being located circumferentially between the dividing vanes; and

a variable-geometry mechanism (Fig. 1) comprising a tubular piston (17) disposed radially inward of the chamber and axially slidable relative to the chamber between a fully open position a closed position in which a fractional portion of the axial length of the sectors is blocked by the piston, wherein the piston and the vanes overlap radially and at least the dividing vanes are recieved in axially extending slots in the piston when the piston is in the closed postion;

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wherein the dividing vanes (23,24) extend fully across the axial length of the sectors so that the sector-division of the turbine housing is preserved when the piston is in the fully open position.

Erdmann et al. is silent as to whether the additional vanes extend along less than the axial length of the sectors and are axially located such that when the piston is in the closed position a portion of the sectors remain open and the additional vanes extend fully across the portion, and when the piston is in the fully open position there is a space between ends of the additional vanes and an end of the piston.

Leavesley discloses additional vanes (102) extend along less than the axial length of the sectors (104) and are axially located such that when the piston is in the closed position a portion of the sectors remain open and the additional vanes extend fully across the portion (Fig. 14), and when the piston is in the fully open position there is a space between ends of the additional vanes and an end of the piston (Fig. 15).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Erdmann et al. such that the additional vanes are axially shorter than the sectors, the additional vane structure extends across the portion and a portion of the sectors remain open in the closed position, and there is a space between ends of the additional vanes and an end of the piston in the open position, as taught by Leavesley because the overlapping design of the vanes of Leavesley enables a more appropriately responsive turbocharger (Col. 1, lines 25-41).

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In regards to claim 20, the modified Erdmann et al. turbocharger comprises the slots in the piston extend radially inwardly less than a fully radial thickness of the piston, such that the slots do not go all the way through to a radially inner side of the piston.

In regards to claim 20, the modified Erdmann et al. turbocharger does not disclose the slots in the piston extend radially inwardly from a radially outer side of the piston.

Leavesley discloses slots in the piston extend radially inwardly from a radially outer side of the piston (Fig. 13).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the Erdmann et al. turbocharger such that the slots in the piston extend radially inwardly from a radially outer side of the piston, as taught by Leavesley because the slot structure enables sector vanes to expand relative to the piston due to thermal stresses.

In regards to claim 21, the modified Erdmann et al. turbocharger comprises the additional vanes and piston are arranged such that in the closed position of the piston, an end of the piston abuts ends of the additional vanes.

3. Claims 18, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Erdmann et al. (WO Publication 2003/080999) in view of Leavesley (US Patent 5,231,831) as applied to claims 15 and 19, and in further view of Bernardini et al. (WO Publication 2001/0053679).

The modified Erdmann et al. turbocharger contains all of the claim limitations except the dividing vanes and additional vanes are mounted on a ring-shaped member separate from the turbine housing.



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Bernardini et al. discloses the vanes mounted on a ring-shaped member separate from the turbine housing (Fig. 1).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the Erdmann et al. turbocharger such that the vanes are mounted on a ring-shaped member separate on the piston separate from the turbine housing, as taught by Bernardini et al., because the vanes on the piston are protected from thermal stresses by the heat screen.

4. Claims 23, 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Erdmann et al. (WO Publication 2003/080999) in view of Bernardini et al. (WO Publication 2001/0053679).

In regards to claim 23, Erdmann et al. discloses a turbine for an exhaust-gas-driven turbocharger, comprising:

a turbine wheel (3);

a sector-divided turbine housing (Fig. 2) defining a generally annular chamber structured and arranged to surround a turbine wheel (3), a plurality of circumferentially spaced dividing walls (25, 26) extending generally radially inwardly from a radially outer wall of the chamber and dividing the chamber into a plurality of separate angular sectors each of which occupies a fractional part of a circumference of the chamber, each sector of the chamber at a radially inward side thereof having an axial length;

a variable-geometry mechanism (Fig. 1) comprising a tubular piston (17) disposed radially inward of the chamber and axially slidable relative to the chamber between a fully open

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position a closed position in which a fractional portion of the axial length of the sectors is blocked by the piston;

a vane assembly (10, 23 and 24) for guiding flow from the chamber into the turbine wheel, the vane assembly comprising a ring of circumferentially spaced vanes that include dividing vanes and additional vanes, the dividing vanes corresponding in number to the number of dividing walls, each dividing vane forming an extension of one of the dividing walls and extending generally radially inwardly from the dividing wall and terminating at a trailing edge of the dividing vane, the additional vanes being located circumferentially between the dividing vanes; and

In regards to claim 23, Erdmann et al. does not disclose the ring of circumferentially spaced vanes affixed to an end of the piston, and a fixed structure having slots through which at least the dividing vanes extend when the piston is moved toward the closed position.

Bernardini et al. disclose the ring of circumferentially spaced vanes affixed to an end of the piston (Fig. 1), and a fixed structure (92) having slots (abstract, Fig. 1) through which the vanes extend when the piston is moved toward the closed position.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Erdmann et al. such that the vanes are affixed to an end of the piston, and extend through the fixed structure as taught by Bernardini et al. because the vanes on the piston are partially protected from thermal stresses via the heat screen.

In regards to claim 25, the modified Erdmann et al. turbine does not comprise the additional vanes are the same length as the dividing vanes and the fixed structure includes slots for the additional vanes.

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Bernardini et al. disclose vanes of the same length and the fixed structure (92) includes slots (abstract, Fig. 1) for vanes.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify Erdmann et al. such that the vanes are the same length, and the fixed structure includes slots for vanes as taught by Bernardini et al. because the vanes of the same length ensure the contact interface in between the piston and housing is even around the circumference and slotted vane structure protects the blades from thermal stresses via the heat screen.

In regards to claim 26, modified Erdmann et al. turbine comprises the fixed structure (92) as a heat shroud.

5. Claim 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Erdmann et al. (WO Publication 2003/080999) in view of Bernardini et al. (WO Publication 2001/0053679) in further view of Leavesley (US Patent 5,231,831).

The modified Erdmann et al. turbine contains all of the claimed features except the additional vanes are shorter than the dividing vanes.

Leavesley discloses additional vanes (102) are shorter than the dividing vanes (104).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify Erdmann et al. such that the additional vanes are shorter than the dividing vanes, as taught by Leavesley because shorter additional vanes increases the gap size and prevents excessive pressure build up in the chamber (Leavesley Col. 1, lines 34-36).

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to JESSE PRAGER whose telephone number is (571)270-1412.

The examiner can normally be reached on Monday-Friday, 9:00 am - 5:00 pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Look can be reached on (571)272-4820. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/JESSE PRAGER/  
Examiner, Art Unit 3745

10/7/2009

/Edward K. Look/  
Supervisory Patent Examiner, Art Unit 3745